Better Training for Safer Food
Initiative

Neil Giltrap

Emergency Decision for *Xylella fastidiosa*

Session 10

Food safety

Outline of Talk

- **Biology of disease**
- **Symptoms**
- **Situation in Italy**
- **Outbreaks in Corsica and mainland France**
- **Outbreak in Germany**
- **Latest Emergency Decision**

Xf in Italy (reported October 2013)

8,000 ha in total in Lecce province (1,000 ha of olives severely affected)

March 2014 - 23,000 ha of olives

- 5 smaller sites found.

Vector – *Philaenus spumarius* widespread in Europe.

Gallipoli

European Commission

Xylella on Olives in Italy

- **Present for many years**
- **Old olive trees affected**
- **Symptomatic trees often affected by a complex of pests:**
  - ***X. fastidiosa***
  - **fungal species (*Phaeoacremonium* and *Phaemoniella* species), and**
  - ***Zeuzera pyrina* (leopard moth)**

European Commission

Biology of Xylella

- **Bacterium very difficult to isolate**
- **Transmitted by xylem fluid feeding insect vectors (large number)**
- **bacterial blockage of xylem (water/nutrients)**
- **New strain of *Xf* in Italy– close to 'pauca strain' but different - CoDiRO strain**
- **France – multiplex subspecies**
- **Germany – fastidiosa subspecies**
- **Spain (Mallorca, Menorca, Ibiza) - CoDiRO, fastidiosa and multiplex**
- **Czech Republic - ? Interception ? subspecies**

Main Vector – Philaneus spumarius

- froghopper – meadow spittle bug
- overwinter as eggs , nymphs develop within bubbles of plant sap
- no vertical transmission to eggs – nymphs feed on infected plants
- very efficient vector
- not a good flier
- very widespread in Europe
- feeds on wide range of plants
- Italy - moves from vegetation under trees to olive trees in summer

Biology of *Xylella fastidiosa*

6? subspecies – *fastidiosa, pauca, multiplex, sandyi , fashke & morus*

Different hosts - specificity of vector or strain of bacterium?

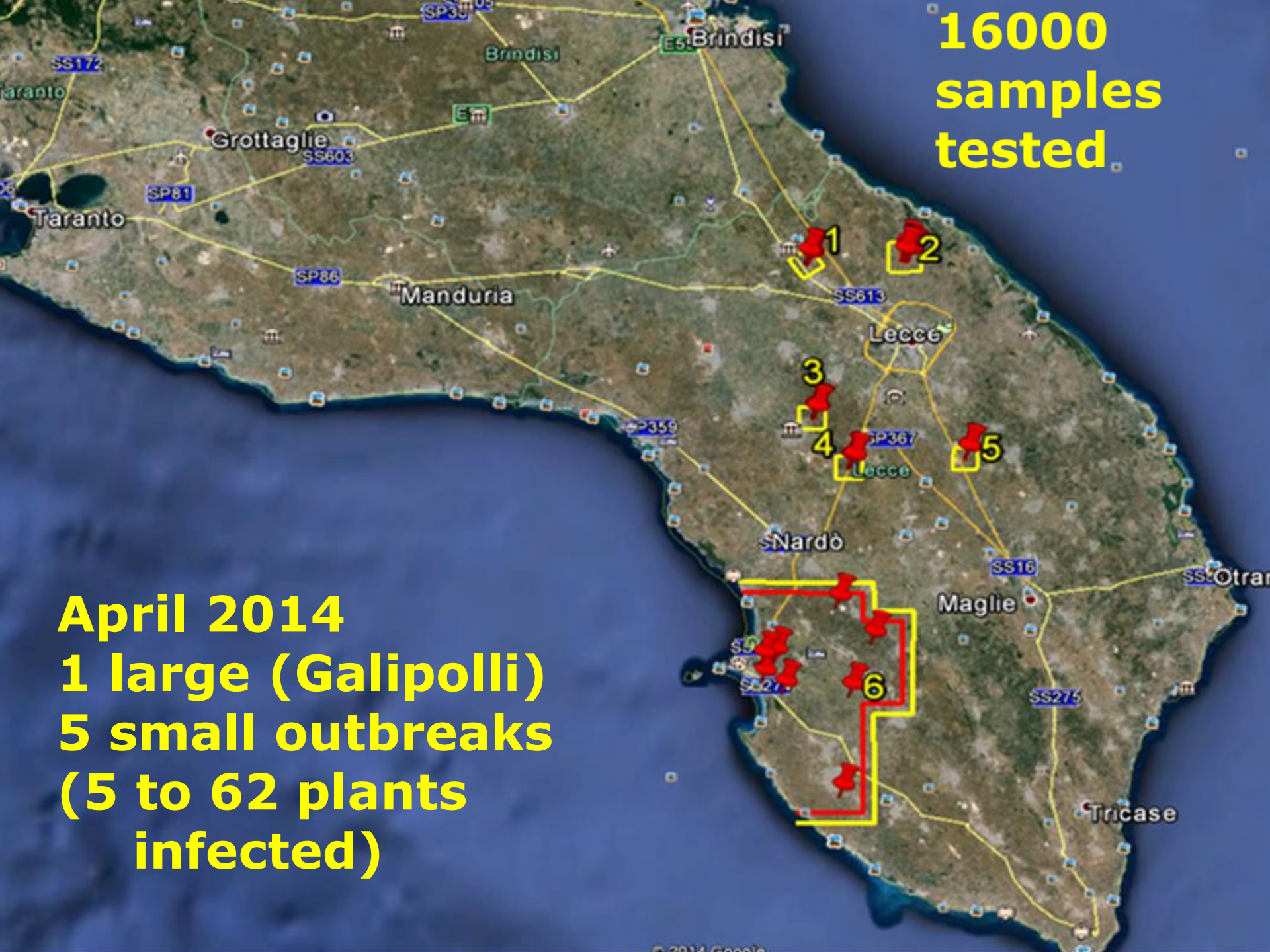
Subspecies	Distribution	Important susceptible plants
fastidiosa	Central and North America, Taiwan	Grapevines, citrus, coffee, almond
pauca	Brazil, Paraguay, Argentina	Citrus, coffee
multiplex **Proposed subspecies**	USA, Brazil	Almond, peach, plum, oak, blueberry, pecan, etc
sandyi **tashke** **morus**		**Oleander** ***Chitalpa tashkentensis*** **Mulberry**

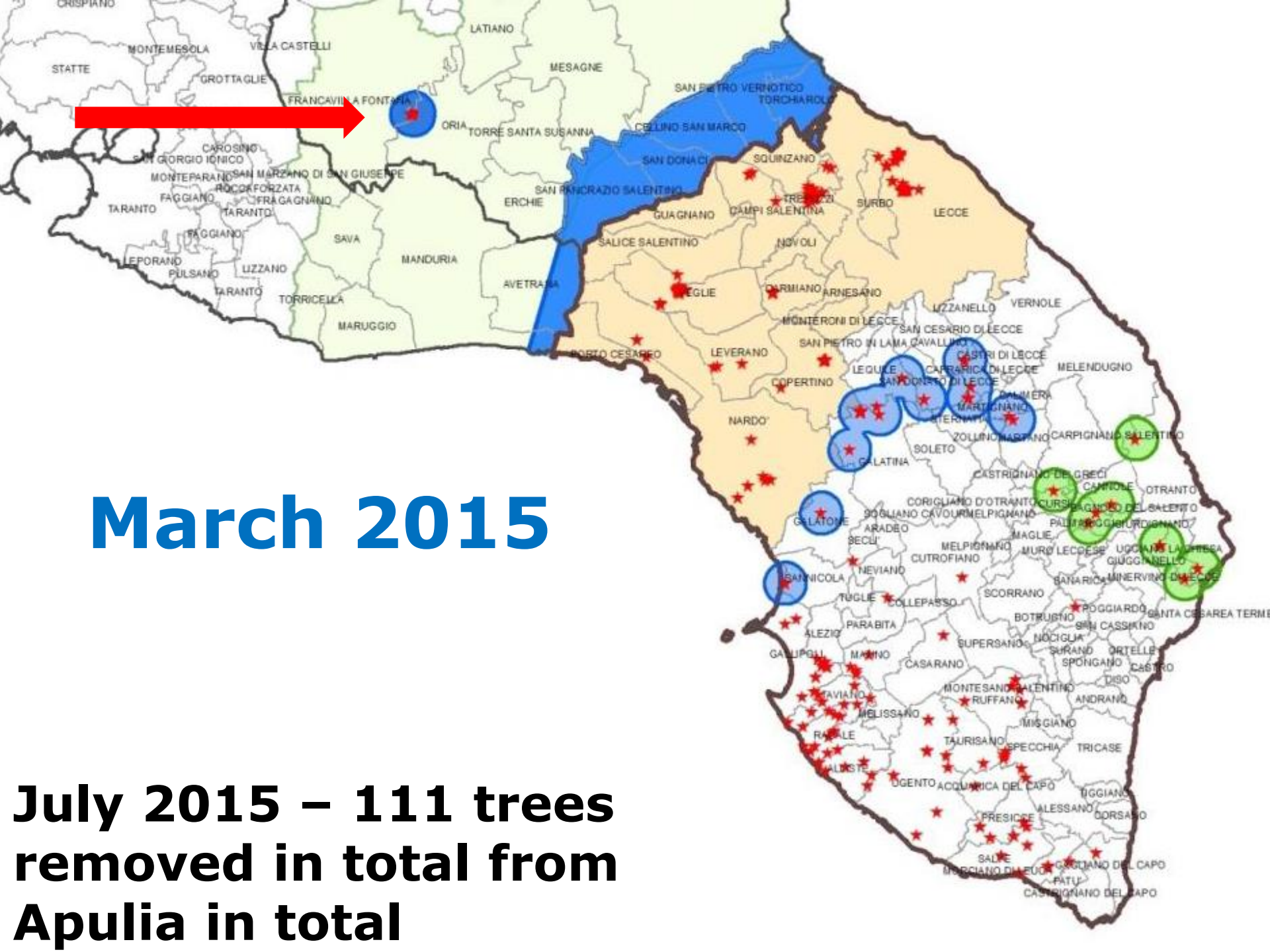
Many wild plants (grasses, sedges, trees) carry pathogen without showing symptoms

European Commission

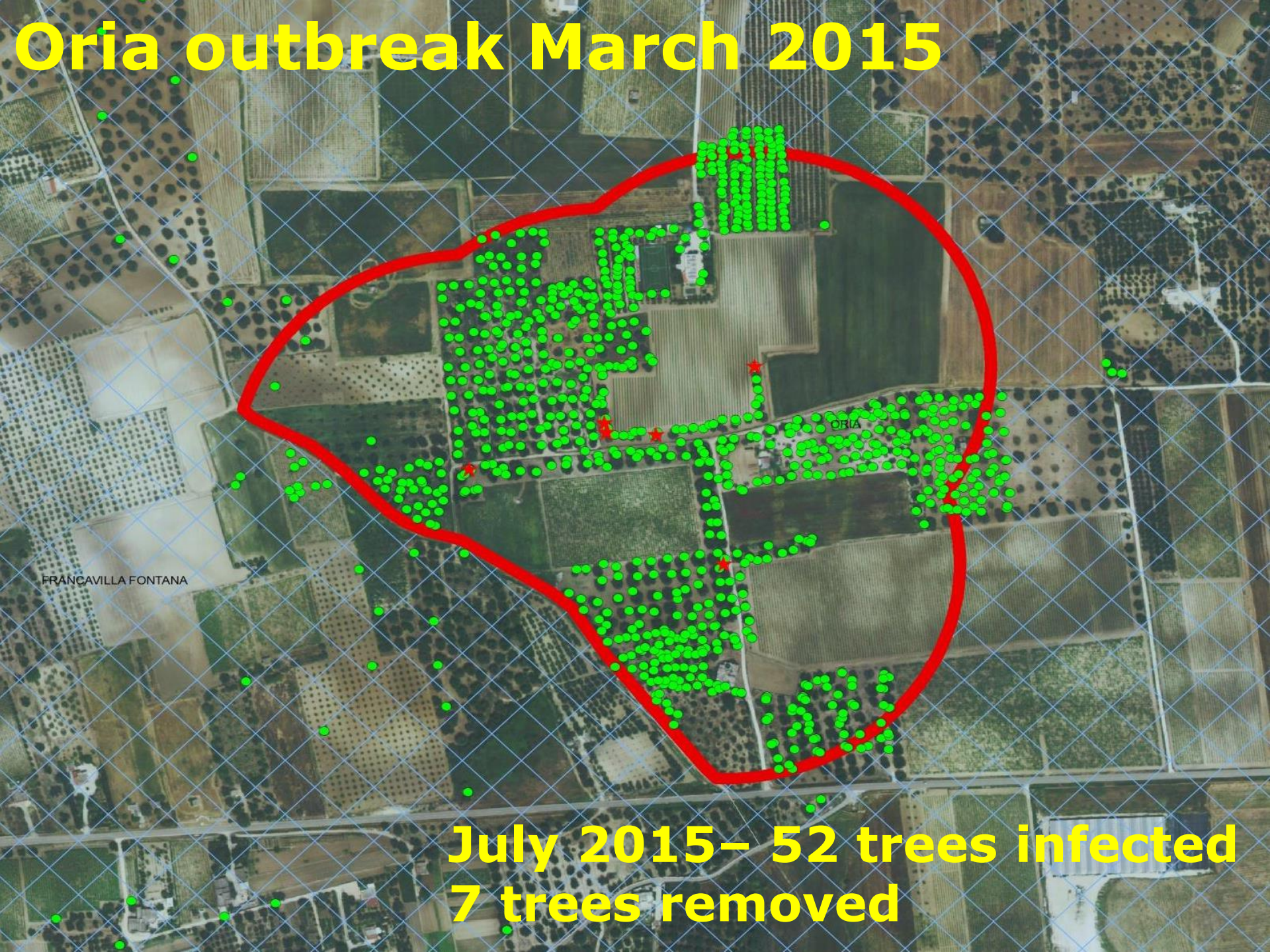
Outbreak in Italy


Puglia
E843
Brindisi
55
Taranto
Lecce
Lecce
Grapevine Nurseries (ca. 80)
2013: Lecce Province in Apulia Region
X. fastidiosa
Galipolli
Image Landsat
© 2013 Google
US Dept of State Geographer
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Google


16000
samples
tested
April 2014
1 large (Galipolli)
5 small outbreaks
(5 to 62 plants
infected)
Brindisi
Grottaglie
Taranto
Manduria
Lecce
Nardò
Maglie
Tricase
1
2
3
4
5
6

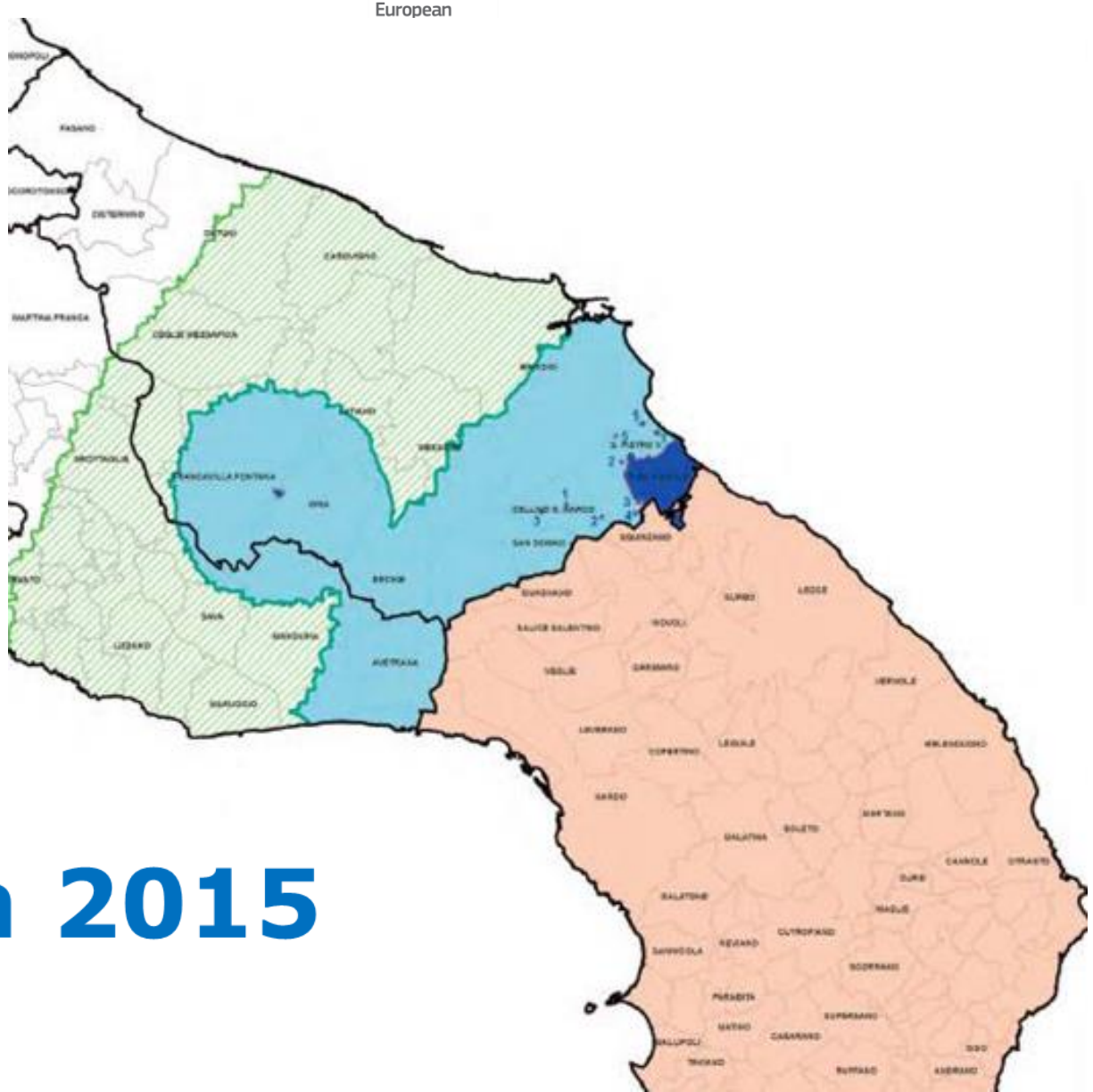

March 2015
July 2015 – 111 trees removed in total from Apulia in total
CRISPIANO
MONTEMESOLA
VILLA CASTELLI
STATTE
GROTTAGLIE
FRANCAVILLA FONTANA
ORIA
TORRE SANTA SUSANNA
LATIANO
MESAGNE
SAN PIETRO VERNOTICO
TORCHIAROLO
CELLINO SAN MARCO
SAN DONACI
CAROSINO
SAN GIORGIO IONICO
MONTEPARANO
SAN MARZANO DI SAN GIUSEPPE
ROCCAFORZATA
FRAGAGNANO
FAGGIANO
TARANTO
SAVA
MANDURIA
LEPORANO
PULSANO
LIZZANO
AVETRANA
TORRICELLA
MARUGGIO
ERCHIE
SAN PANCRAZIO SALENTINO
SQUINZANO
TREPUZZI
CAMPI SALENTINA
SURBO
LECCE
GUAGNANO
SALICE SALENTINO
NOVOLI
VERNOLE
LIZZANELLO
MONTERONI DI LECCE
SAN CESARIO DI LECCE
SAN PIETRO IN LAMA CAVALLINO
CASTRI DI LECCE
LEVERANO
LEQUILE
CARMIANO
ARNESANO
PORTO CESAREO
COPERTINO
SAN DONATO DI LECCE
CAVALLINO
MELENDUGNO
NARDO'
MARTIGNANO
ZOLLINO
MARTANO
CARPIGNANO SALENTINO
SOLETO
GALATINA
CASTRIGNANO DE' GRECI
CANNOLE
OTRANTO
CORIGLIANO D'OTRANTO
CURSI
SOGLIANO CAVOURMELPIGNANO
PALMARIGGI
GALATONE
ARADEO
SECLI'
MAGLIE
MELPIGNANO
MURO LECCESE
CUTROFIANO
GIUGGIANELLO
NEVIANO
SANNICOLA
SANARICA
MINERVINO DI LECCE
SCORRANO
TUGLIE
COLLEPASSO
POGGIARDO
BOTRUGNO
SAN CASSIANO
PARABITA
ALEZIO
NOCIGLIA
SUPERSANO
SURANO
ORTELLE
GALLIPOLI
MATINO
CASARANO
SPONGANO
CASTRO
DISO
TAVIANO
MONTESANO SALENTINO
RUFFANO
ANDRANO
MELISSANO
MISSIANO
RACALE
TAURISANO
SPECCHIA
TRICASE
ALEZIO
OGENTO
ACQUARICA DEL CAPO
TIGGIANO
ALESSANO
CORSANO
PRESICCE
SALVE
MORCIANO DI LEUCA
GAGLIANO DEL CAPO
PATU'
CASTRIGNANO DEL CAPO

Oria outbreak March 2015



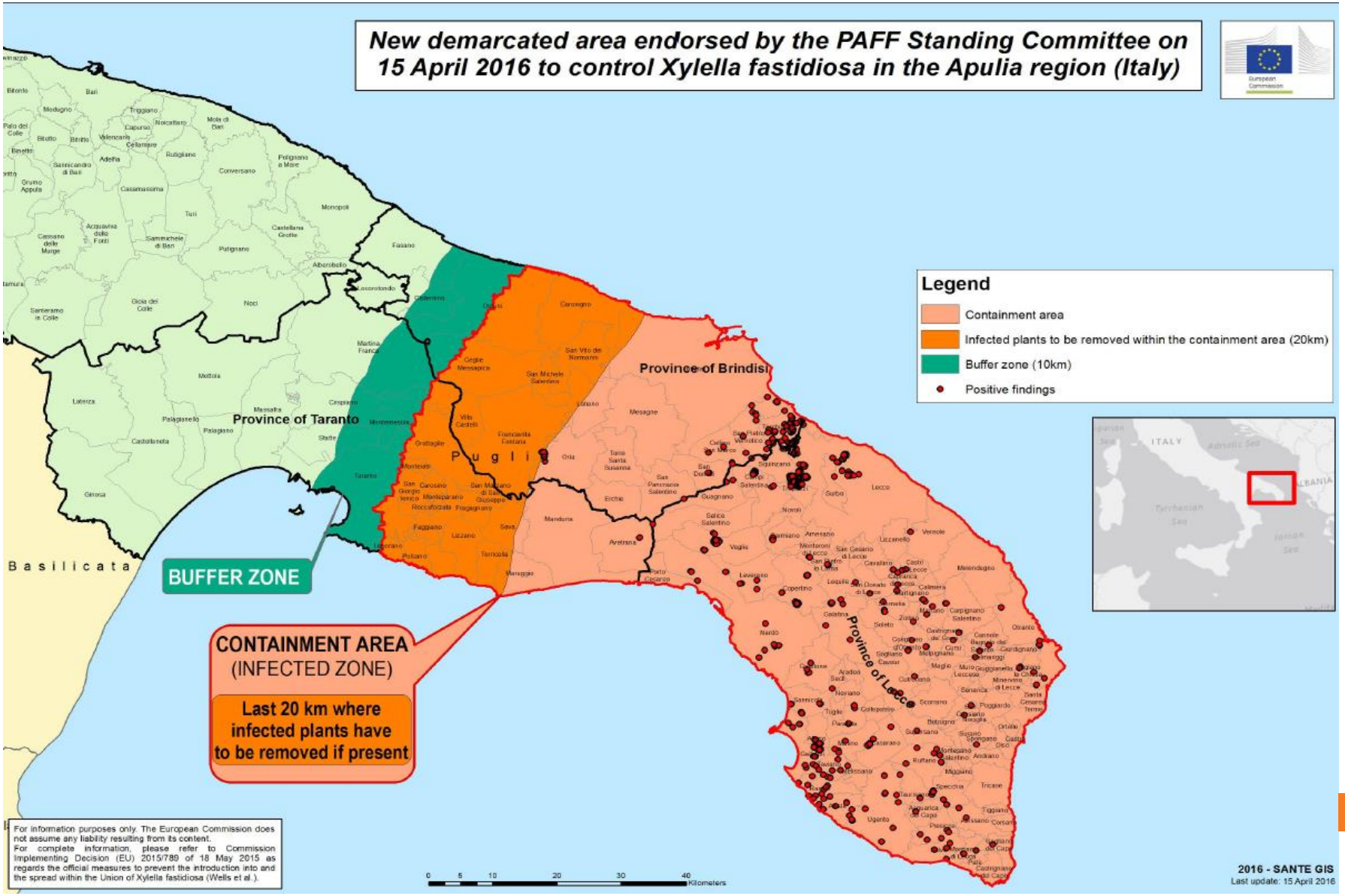
July 2015– 52 trees infected
7 trees removed

European



March 2015

X. fastidiosa – Italy (PHSC, April 2016)



Outbreak in Corsica July 2015

Hedge of *Polygala myrtifolia* planted 2010

Multiplex strain

Outbreak - mainland France in September 2015 – *Polygala* mainly and multiplex strain

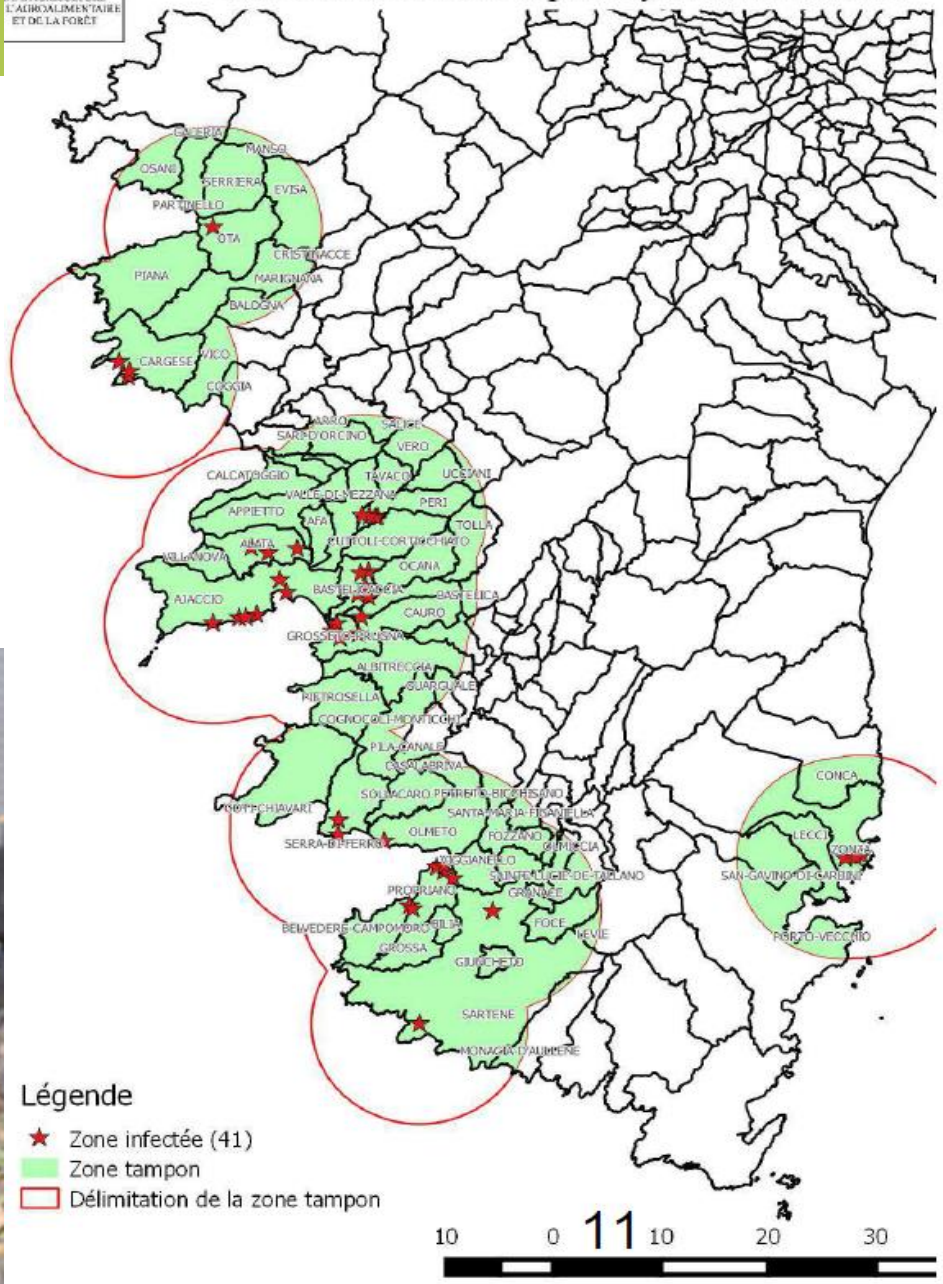
Outbreak multiplex – Corsica, August 2015

- **56 outbreaks (133 positives) on *Polygala myrtifolia* mainly**
- **Imported *Polygala* plants from Italy, Spain (Portugal and France) by Dutch traders suspected**
- **Imports date back to 2007**
- **Destruction 100m and 10km buffer zone**
- **Multiplex bigger threat to northern Europe**

RÉPUBLIQUE FRANÇAISE

MINISTÈRE DE L'AGRICULTURE L'AGROALIMENTAIRE ET DE LA FORÊT

Carte des zones tampons de 10 km autour des zones infectées par Xylella fastidiosa.



Légende

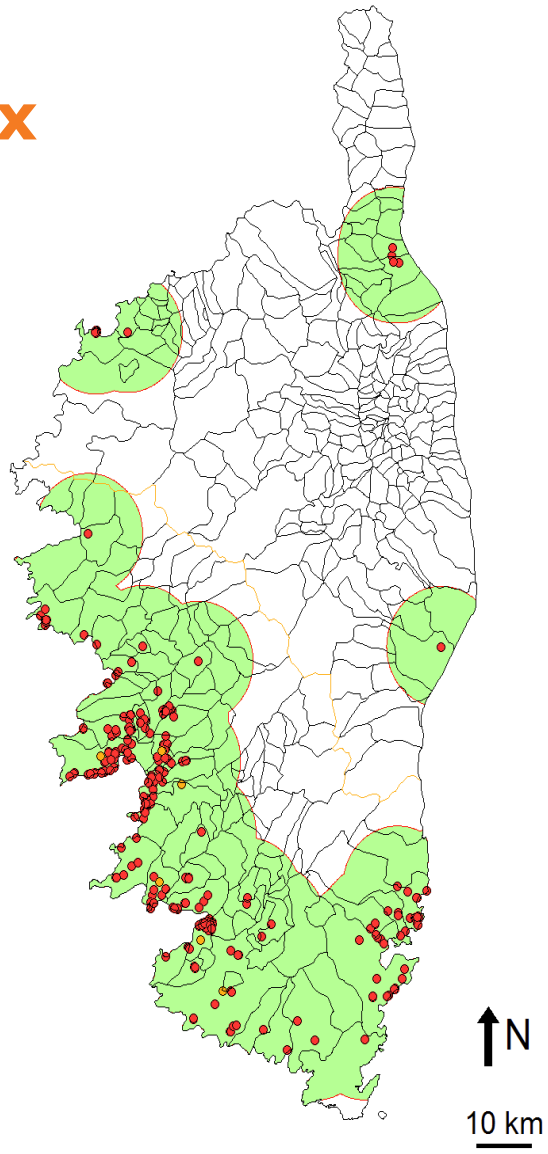
- Zone infectée (41)
- Zone tampon
- Délimitation de la zone tampon

10 0 11 10 20 30

X. fastidiosa subsp. multiplex - where is it?

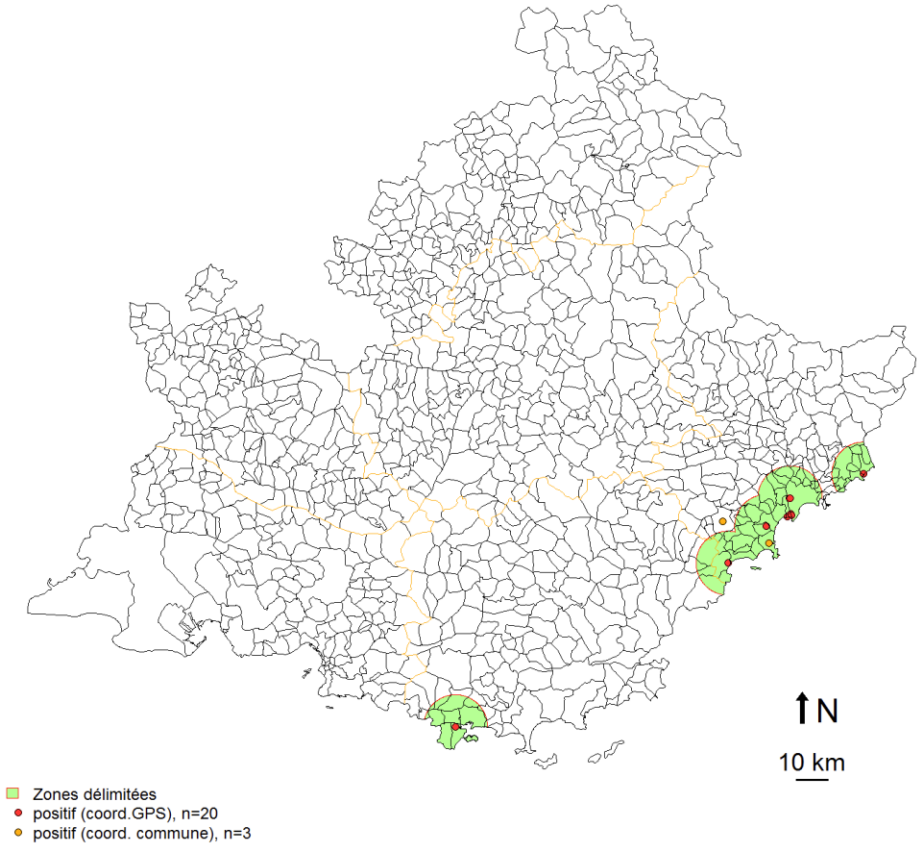
Corsica

Map of "Demarcated Areas" in Corsica - January 2016



X. fastidiosa subsp. multiplex - where is it?

Mainland France



Map of 'Demarcated Areas' located in Provence-Alpes-Côte d'Azur (France) - January 2016

Outbreak in France (March 2017)

- **340 outbreaks in Corsica**
- **20 outbreaks in PACA (mainland France)**

Outbreak fastidiosa – Germany , May/June 2016

- **One potted *Nerium oleander* plant in small glasshouse on small nursery producing vegetable and ornamental plants in Saxony**
- **Plant owned by amateur grower - kept overwinter in glasshouse**
- **Plant grown from cutting 4 years ago taken from another private person**
- **In November 2016 – *Streptocarpus* hybrids and *Erysimum* hybrids confirmed infected at nursery - destroyed**

Outbreak in Balearics (October 2016)

- ***Prunus avium*** **plants found at garden centre in Mallorca – present since 2007**
- **Infected *Polygala* found later at nursery**
- **Extensive survey work – more outbreaks found - olive, lavender, acacia, plum and almond**
- **March 2017 - 189 outbreaks**
  - **124 Mallorca**
  - **49 Ibiza**
  - **16 Menorca**
- **Subspecies -pauca, fastidiosa and multiplex**
- **Trace back to mainland suppliers - negative**

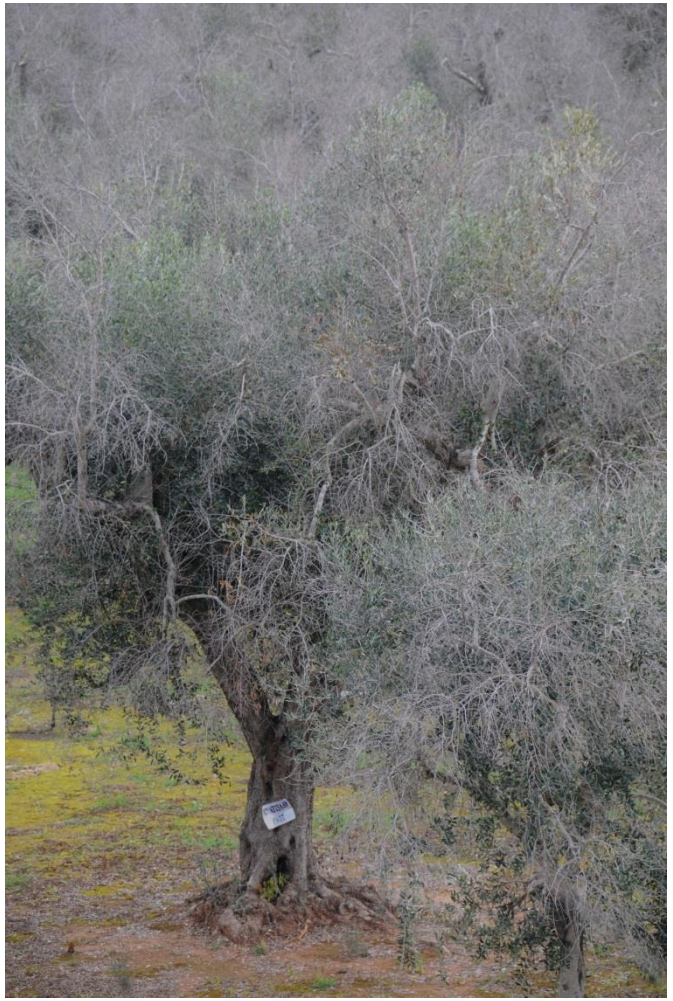
European Commission

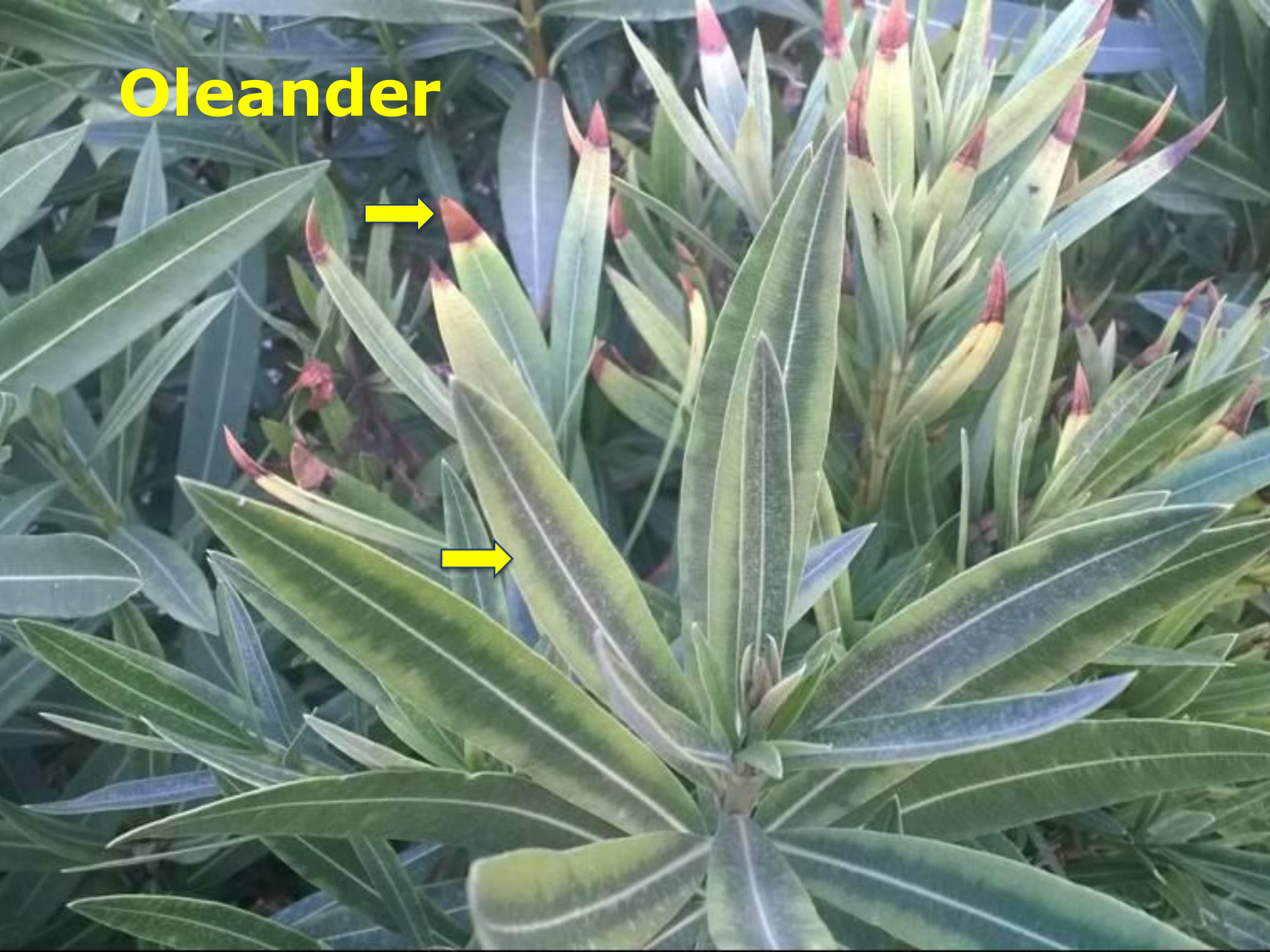
Symptoms similar for all subspecies and strains

- **Marginal leaf scorching**
- **Wilting of foliage and withering of branches**
- **Leaf yellowing/ chlorosis**
- **Dieback and stunting**
- **Eventual plant death from severe infections**
- **Easily confused with other causes**

European Commission

Symptoms




Oleander


Oleander


Prunus dulcis


Prunus avium


Acacia


Westringia fructicosa


Ginestra

Early host plants in Italy

Confirmed hosts

Olea europea (olive)

Nerium oleander (oleander)

Prunus dulcis (almond)

Vinca rosea (perwinkle).

X. f. pauca– host plants in Italy July 2016

Acacia saligna
Asparagus acutifolius
Catharanthus species
Myrtus communis
Cistus creticus
Dodonaea viscosa
Eremophila maculata
Euphorbia terracina
Grevillea juniperina
Laurus nobilis
Lavandula angustifolia
Lavandula stoechas
Myrtus communis
Myoporum insulare
Nerium oleander
Olea europaea
Phillyrea latifolia
Polygala myrtifolia
Prunus avium
Prunus dulcis
Rhamnus alaternus
Rosmarinus officinalis
Spartium junceum
Vinca species
Westringia fruticosa
Westringia glabra

X. f (*multiplex*) – host plants France (July 2016)

Acer pseudoplatanus
Artemisia arborescens
Asparagus acutifolius
Calicotome villosa
Cistus monspeliensis
Cistus salviifolius
Coronilla valentina
Cytisus scoparius
Genista x spachiana (syn. Cytisus racemosus Broom)
Genista corsica
Genista ephedroides
Hebe species
Helichrysum italicum
Lavandula angustifolia
Lavandula dentata
Lavandula stoechas L.
Lavandula x allardii (syn. Lavandula x heterophylla)
Metrosideros excelsa
Myrtus communis
Pelargonium graveolens
Phagnalon saxatile .
Polygala myrtifolia L.
Prunus cerasifera Ehrh.
Quercus suber L.
Rosa x floribunda
Rosmarinus officinalis L.
Spartium junceum L.

X. f (*fastidiosa*) – host plants in Germany

Nerium oleander

Streptocarpus hybrids

Erysimum hybrids

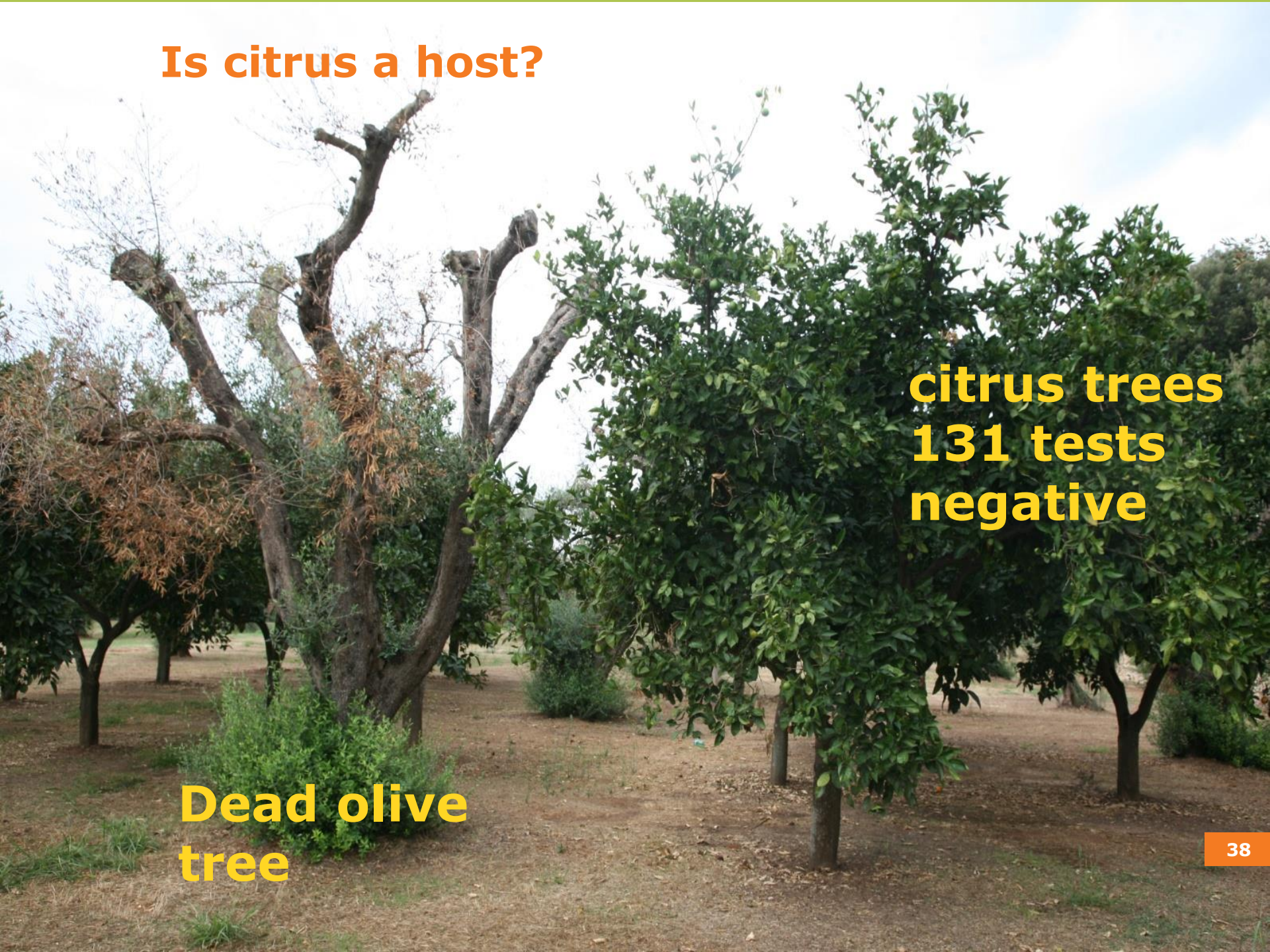
Xf host plants in Italy

Extensive survey work in Italy

Not detected in: *Vitis* spp.,*Citrus* spp.

Artificial infection experiments - negative results

Is citrus a host?



Susceptibility of Olea to CoDiRO strain

- 5 olive cultivars needle inoculated
- All cultivars infected
- ***Coratina* much less susceptible**
  - Infection less systemic – bacteria slower to move upwards in stem and downwards to roots
  - Symptoms developed much slower
  - Appearance of symptoms linked to systemic infection
  - More negative PCR testing at inoculum site

Eradication/Containment Measures

Italian Outbreaks

Large Gallipoli site – very limited tree removal by summer 2015 and since then

Oria outbreak – slow to remove trees

2017 FVO report – still an issue


CAT
320C

Emergency measures

Imports into EU from countries where *X.fastidiosa* present (all sub species):

Long list of host species and some genera

Pest free area OR

Pest free place of production

- **Entire life under complete physical protection**
- **No vectors or symptoms of disease seen**

Emergency measures

Italy - Infected (containment) zone

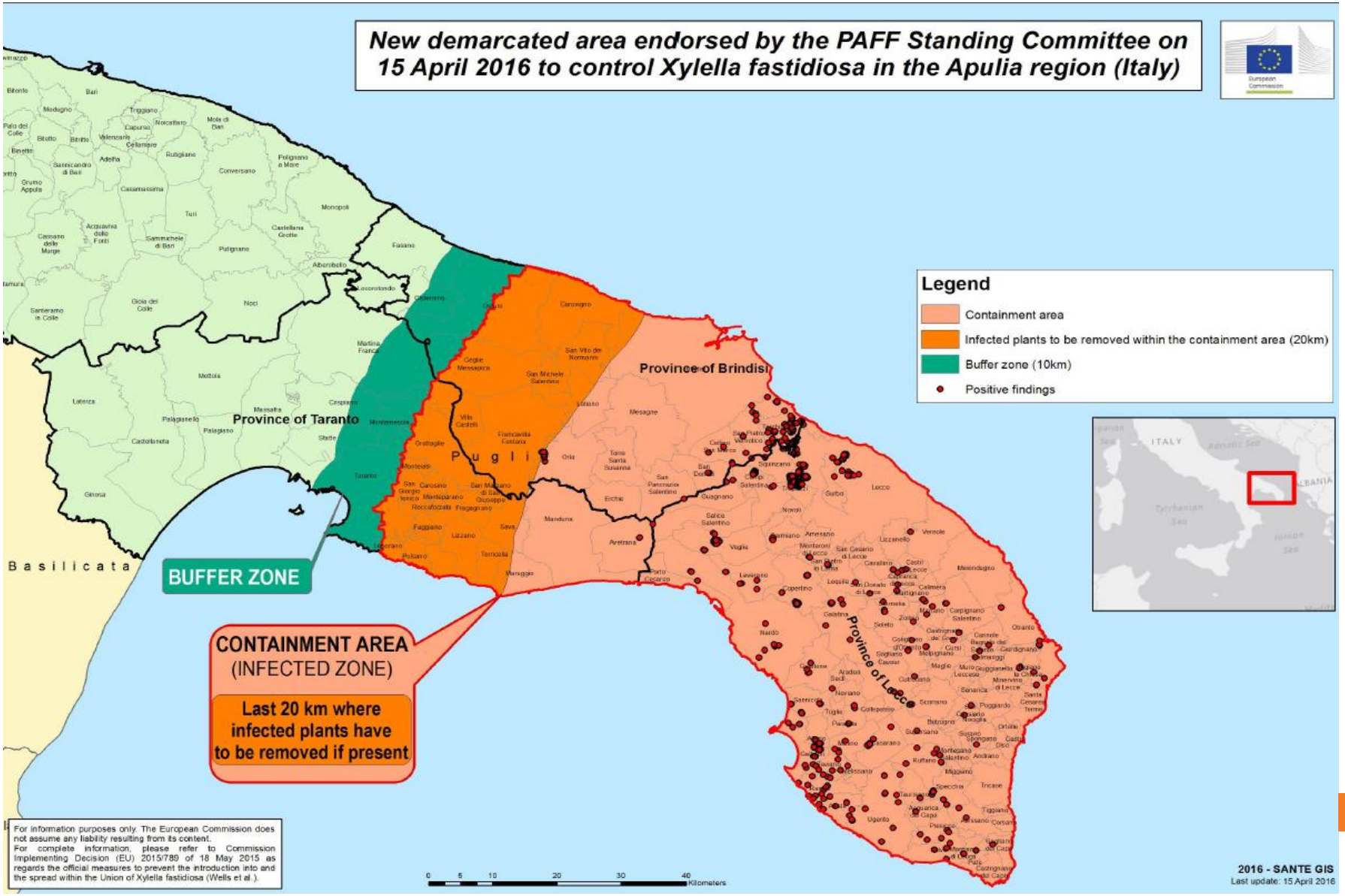
All infected plants destroyed but only in outer 20km zone

Also testing of host plants within 100m of infected plants in 20km zone

Buffer zone

10km buffer zone next to infected zone

X. fastidiosa – Italy (PHSC, April 2016)



Emergency Measures – Outbreak measures

Outbreaks outside containment zone in Italy and Outbreaks in other MS

- **Destroy infected trees**
- **Precautionary destruction of all known hosts within within 100m**
- **Buffer zone 10km – no movement of specified plants**

Xylella outbreaks - implications

- **An outbreak could lead to 'host' destruction (depends on subspecies) within 100m**

- **A 10km-wide zone banning all specified plant movements for five years.**

What happens if the *Xylella* is found?

- **An interception - when the Xylella confirmed on a plant but it is unlikely to have spread to other plants.**
  - **Factors affecting decision – time of year, plants outdoors, how long plants present, vectors present, spread to surrounding hosts (inspection, testing)**

Likely Action

  - **destruction of the host plants and also destroy any potential hosts in close proximity,**
  - **Further survey work will be carried out to ensure that there has been no spread.**

- **An outbreak occurs when the disease is found on a plant and it has spread**

Emergency measures

Within EU (except containment zone Italy)

All specified plants within demarcated area

- **entire life under complete physical protection**
- **no vectors or symptoms of disease seen**
- **200m radius *Xylella*-free**
- **insecticide treatments**

Emergency measures

Within containment zone in Italy

All specified plants within demarcated area

- **Movement restrictions on specified plants within the infected zones withdrawn**

Plant Passport Requirement

- for all 'professional operators' it requires that the movement of all 'host plants' across the EU must be accompanied by a plant passport.
- Landscapers, designers, retailers and anyone directly importing plants are now subject to the same measures as growers and suppliers

Summary

- ***Xylella*** **continuing to spread in Italy, France and Spain**
- **EU Measures difficult to implement fully ……..especially in Italy**
- **host range increasing….**
- **Main risk of spread is plants for planting**
  - **Difficult to prevent – long latent period, testing difficulties symptomless infection**
  - ***Olea, Polygala, Nerium*** **very susceptible**
- ***Xylella*** **more widespread worldwide than records indicate**
- **More outbreaks in EU will be detected**

Thank You!

Neil Giltrap

Better Training for Safer Food
BTSF

European Commission
Consumers, Health and Food Executive Agency
DRB A3/042
L-2920 Luxembourg

Food safety